WHAT IS CLAIMED IS:

1. A microelectromechanical systems (MEMS) element, comprising:
a crystalline substrate having a crystal structure characterized by two or more substrate crystal axes;
a moveable element moveably attached to the substrate;
wherein the moveable element includes a perpendicular portion oriented substantially perpendicular to a plane of the substrate;
wherein the perpendicular portion of the moveable element has a crystal structure characterized by one or more moveable element crystal axes;
wherein the crystal structure of the perpendicular portion of the moveable element is substantially the same as the crystal structure of the substrate;
wherein, when the moveable element is in at least one position, a part of the perpendicular portion projects beyond a surface of the substrate;
wherein, when the moveable element is in at least one position, two or more of the moveable element crystal axes are oriented substantially parallel to two or more corresponding substrate crystal axes.

2. The MEMS element of claim 1 wherein the moveable element is substantially restricted to movement in a plane substantially perpendicular to the plane of the substrate.

3. The MEMS element of claim 2 wherein moveable element may rotate about a rotation axis.

4. The MEMS element of claim 3 wherein the rotation axis is substantially parallel to the plane of the substrate.

5. The MEMS element of claim 4 wherein rotation axis is oriented substantially perpendicular to a plane of the moveable element.

6. The MEMS element of claim 1 wherein the perpendicular portion of the moveable element is formed from a portion of the crystalline substrate.

7. The MEMS element of claim 6 wherein the moveable element is formed from the substrate.

8. The MEMS element of claim 1 wherein the moveable element includes a light-deflecting component.

9. The MEMS element of claim 8 wherein the light-deflecting portion includes a reflective coating.

10. The MEMS element of claim 9 wherein the light deflecting is disposed on two sides of the perpendicular portion.

11. The MEMS element of claim 1 wherein the moveable element is moveably attached to the substrate at fist surface of the substrate.

12. The MEMS element of claim 11 wherein the substrate includes a second surface; and
wherein the second surface of the substrate is substantially parallel to the first surface of the substrate.

13. The MEMS element of claim 1:
wherein the movable element includes a clamping plate attached to an edge of the perpendicular portion of the moveable element;
wherein the clamping plate is oriented substantially perpendicular to the moveable element;
wherein the clamping plate is oriented substantially parallel to a first surface of the substrate;
wherein, when the moveable element is in at least one position, the clamping plate engages the first surface of the substrate.

14. The MEMS element of claim 1, further comprising:
an actuator coupled to the moveable element.

15. The MEMS element of claim 14 wherein the actuator includes a magnetic material disposed on the moving element

16. The MEMS element of claim 14 wherein the actuator includes an electrode.

17. The MEMS element of claim 14 wherein the actuator is thermally or electrostatically actuated.

18. The MEMS element of claim 14 wherein the actuator may move the moveable element between the at least one position in which the perpendicular portion projects beyond the surface of the substrate and a second position.

19. The MEMS element of claim 14 further comprising a biasing element coupled to the moveable element.

20. The MEMS element of claim 1 further comprising a latch coupled to the substrate for retaining the moveable element in at least one position.

21. The MEMS element of claim 20 wherein the latch includes a latch plate and one or more guides for restricting a range of motion of the latch plate.

22. The MEMS element of claim 21 further comprising a stop for restricting a motion of the latch.

23. The MEMS device of claim 21 further comprising an actuator coupled to the latch plate.

24. A MEMS element comprising:
a substrate;
a moveable element moveable attached to the substrate for motion substantially constrained to a plane oriented substantially perpendicular to a plane of the substrate;
wherein the moveable element has a perpendicular portion;
wherein the perpendicular portion is formed from the material of the substrate; and
wherein the perpendicular portion is formed substantially perpendicular portion to the substrate;
wherein, when the moveable element is in at least one position, a part of the perpendicular portion projects beyond a surface of the substrate.

25. The MEMS element of claim 24 wherein the moveable element is attached to a surface of the substrate that is opposite the surface beyond which the perpendicular portion may project.

26. The MEMS element of claim 24 wherein the perpendicular portion includes a light-deflecting component.

27. The MEMS element of claim 26 wherein the light-deflecting component is a reflective coating.

28. The MEMS element of claim 27 wherein the reflective coating is disposed on two surfaces of the perpendicular portion.

29. The MEMS element of claim 24, further comprising a clamping plate attached to the perpendicular portion.

30. The MEMS element of claim 29, further comprising a flexure attached to the clamping plate and the substrate.

31. The MEMS element of claim 30 wherein the flexure is a torsional flexure.

32. The MEMS element of claim 30 wherein the flexure is a pre-stressed flexure,

33. The MEMS element of claim 32 wherein the pre-stressed flexure is a thermal bimorph flexure.

34. The MEMS element of claim 32 wherein the pre-stressed flexure is an electrostatic zip actuator.

35. An optical switch comprising:
a crystalline substrate having a crystal structure characterized by two or more substrate crystal axes;
one or more moveable elements moveably attached to the substrate;
wherein each moveable element includes a perpendicular portion oriented substantially perpendicular to a plane of the substrate;
wherein the perpendicular portion of each moveable element has a crystal structure characterized by one or more moveable element crystal axes;
wherein the crystal structure of each perpendicular portion is substantially the same as the crystal structure of the substrate;

wherein, when a given moveable element is in at least one position, two or more of the moveable element crystal axes for the given element are oriented substantially parallel to two or more corresponding substrate crystal axes;
wherein, when a given moveable element is in at least one position, a part of the perpendicular portion projects beyond a surface of the substrate;.

36. The optical switch of claim 35 wherein one or more of the moveable elements include a light deflecting portion.

37. The optical switch of claim 35, further comprising one or more optical fibers optically aligned with one or more of the optical elements.

38. The optical switch of claim 35 wherein each moveable element is formed from a portion of the crystalline substrate.

39. The optical switch of claim 35 wherein one or more of the moveable elements may rotate about a rotation axis.

40. The optical switch of claim 39 wherein the rotation axis is substantially parallel to the plane of the substrate.

41. The optical switch of claim 40 wherein the rotation axis is substantially perpendicular to a plane of at least one of the moveable elements.

42. The optical switch of claim 35 wherein one or more of the moveable elements may translate in a direction substantially perpendicular to a plane of the substrate.